



## General

### Guideline Title

Guidelines for the diagnosis and treatment of pediculosis capitis (head lice) in children and adults 2013.

### Bibliographic Source(s)

University of Texas, School of Nursing Family Nurse Practitioner Program. Guidelines for the diagnosis and treatment of pediculosis capitis (head lice) in children and adults 2013. Austin (TX): University of Texas, School of Nursing; 2013 May. 21 p. [57 references]

### Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: University of Texas, School of Nursing, Family Nurse Practitioner Program. Guidelines for the diagnosis and treatment of pediculosis capitis (head lice) in children and adults. Austin (TX): University of Texas, School of Nursing; 2008 May. 17 p.

## Recommendations

### Major Recommendations

Strength of recommendations (A, B, C, D, I) and quality of evidence (High, Moderate, Low) are defined at the end of "Major Recommendations" field.

#### Diagnosis

- Combing with a louse comb (fine tooth comb, <3 mm between teeth) is vastly superior to visual inspection for diagnosis of head lice infection (Mumcuoglu et al., 2001; Jahnke et al., 2009; Balcioglu et al., 2008; Goundry-Smith, 2011; Mumcuoglu et al., 2006; Ibarra, 2010; Feldmeier, 2012; Gunning et al., 2012; Frankowski et al., 2010; Tebruegge, Pantazidou, & Curtis, 2011; Finlay & MacDonald, 2008). (Evidence Moderate, Recommendation A)
- Treatment for lice should be limited to individuals with finding of live lice on the scalp; however, presence of eggs within 1 cm of scalp should raise index of suspicion and prompt further inspection to find a live louse (Frankowski et al., 2010; Mumcuoglu et al., 2006; Feldmeier, 2010; Gunning et al., 2012; Finlay & MacDonald, 2008; Tebruegge, Pantazidou, & Curtis, 2011; Goundry-Smith, 2011). (Evidence Low, Recommendation B)
  - No primary studies were identified in the literature, however expert opinion is widely in agreement.
- Lice may be easier to detect behind the ears and at the back of the head or nape of the neck (Schmidt & Levitt, 2012; Madke & Khopkar, 2012; Gunning et al., 2012; Feldmeier, 2012; Frankowski et al., 2010). (Evidence Low, Recommendation B)
  - No primary studies were identified in the literature, however expert opinion is widely in agreement.

## Recommended Regimens

- Permethrin 1% cream rinse (Nix) has well established safety profile and is recommended as first line treatment unless regional resistance is documented. Indicated for patients 2 months and older (Taplin et al., 1986; Brandenburg et al., 1986; Bowerman et al., 1987; Meinking et al., 2007; Frankowski et al., 2010; Diamantis, Morrell, & Burkhart, 2009; Finlay & MacDonald, 2008; Gunning et al., 2012; Heukelbach et al., 2008; Meinking et al., 2002). (Evidence Moderate, Recommendation B)
  - Cream rinse is applied to the hair and scalp for 10 minutes and then rinsed off; second treatment is advised 7-10 days later to ensure cure.
  - Cost: \$20
  - Few recent trials exist because efficacy and safety have long been proven, however expert opinion is widely in support of continued use as first line treatment unless resistance is documented.
  - Suggested sources for documentation of regional resistance are the Centers for Disease Control & Prevention (CDC) website and state/local health departments. Data is still limited at this time, and may not be available.
- Pyrethrin 0.33% & piperonyl butoxide 4% (RID) has a well established safety profile and is recommended as first line treatment unless regional resistance is documented. Indicated for patients 2 years and older (Frankowski et al., 2010; Diamantis, Morrell, & Burkhart, 2009; Finlay & MacDonald, 2008; Gunning et al., 2012). (Evidence Moderate, Recommendation B)
  - Hair is first shampooed and towel dried, the product is applied and rinsed after 10 minutes; a second treatment is advised 7 days later to ensure cure.
  - Cost: \$20
  - Few recent trials exist because efficacy and safety have long been proven, however expert opinion is widely in support of continued use as first line treatment unless resistance is documented resistance.
  - Theoretical risk of cross sensitivity with plant allergies such as ragweed exist but are rare (Prescriber's Letter, 2010). In the case of severe ragweed allergy, it is reasonable to recommend permethrin in preference to pyrethrin/piperonyl butoxide topical.
- 0.5% Malathion lotion has a favorable safety profile and is effective with low observed resistance; use is contraindicated in neonates and infants (Meinking et al., 2004; Taro Pharmaceuticals, 2011; Chosidow et al., 2010; Nofal, 2010; Gunning et al., 2012; Frankowski et al., 2010; Diamantis, Morrell, & Burkhart, 2009; Lebwohl, Clark, & Levitt, 2007; Meinking et al., 2007). (Evidence Moderate, Recommendation B)
  - Lotion is applied to dry hair until thoroughly moistened, left to air dry, and then rinsed out after 8 to 12 hours. Repeat treatment in 7 to 10 days.
  - Cost: \$146-\$189
- Benzyl alcohol 5% lotion (Ulesfia) is the first U.S. Food and Drug Administration (FDA)-approved, non-neurotoxic prescription product for treating head lice that is shown to be safe and effective in patients 6 months and older (Meinking et al., 2010; Martinez-Diaz & Mancini, 2010; Eisenhower & Farrington, 2012; Frankowski et al., 2010; Gunning et al., 2012; Barker & Altman, 2011). (Evidence Low, Recommendation B)
  - Apply to dry hair until well saturated, leave on for 10 minutes and rinse. Repeat treatment in 7 days.
  - Cost: \$81
- Ivermectin 0.5% topical lotion (Sklice) was FDA approved in February 2012 for treatment of head lice in patients greater than 6 months of age (Pariser et al., 2012; Meinking et al., 2013; Strycharz et al., 2011; Strycharz, Yoon, & Clark, 2008). (Evidence Moderate, Recommendation B)
  - Apply a single application of up to 1 tube (4 oz) to dry hair, thoroughly coating the hair and scalp. Rinse off after 10 minutes.
  - A second treatment is not indicated.
  - Cost: \$25
- Spinosad 0.9% topical suspension (Natroba) was FDA approved in January 2011 for patients 4 years and older for effective and convenient treatment for head lice (Stough et al., 2009; Cole & Lundquist, 2011; McCormack, 2011; Villegas & Breitzka, 2012; Aditya & Rattan, 2012; Gunning et al., 2012). (Evidence Low, Recommendation B)
  - Apply up to 120 mL (1 bottle) to dry hair and scalp, leave on for 10 minutes, then rinse; repeat in 7 days only if live lice are seen.
  - Cost: \$220
  - Cross resistance is not expected due to the mechanism of action.

## Alternative Regimens

- Lindane 1% shampoo should be reserved for patients for whom other lice treatments have failed and/or for persons who cannot tolerate other pediculicides; use in infants and children is cautioned (U.S. FDA, 2009; Eisenhower & Farrington, 2012; Frankowski et al., 2010; Thomas et al., 2006; Gunning et al., 2012). (Evidence Moderate, Recommendation C)
  - Apply 1 ounce or 30 mL (2 ounces or 60 mL maximum for long or thick hair) of product to dry hair, paying special attention to fine

hairs at the nape of the neck and behind ears. After four minutes, add water and work into a lather. Immediately and thoroughly rinse off with warm, not hot, water. Avoid unnecessary contact to other body parts, especially the eyes. Following treatment, wet comb the hair with a fine-tooth comb, or use tweezers to remove nits. Do not use again for retreatment.

- Cost: \$137
- Oral ivermectin (Stromectol) has been effective in some studies but is not FDA approved for pediculosis capitis; can be used in all age groups weighing at least 15 kg (CDC, 2010; Frankowski et al., 2010; Gunning et al., 2012; Lebwohl, Clark, & Levitt, 2007; Nofal, 2010; Chosidow et al., 2010; Martinez-Diaz & Mancini, 2010; Currie et al., 2010; Ameen et al., 2010). (Evidence Low, Recommendation C)
  - Occasionally used off-label for resistant cases of pediculosis capitis (FDA-approved for strongyloidiasis, onchocerciasis).
  - Single dose of 200 ug/kg, with a second dose given after 9 to 10 days
  - Cost: \$20
- Trimethoprim/sulfamethoxazole (TMP/SMX) (Bactrim, Septra) is occasionally used off-label for head lice, but is not approved by the FDA for this use; for other indications, approved for use in infants 2 months and older (Gunning et al., 2012; Lebwohl, Clark, & Levitt, 2007; Frankowski & Weiner, 2002; Frankowski et al., 2010; Martinez-Diaz & Mancini, 2010). (Evidence Low, Recommendation C)
  - Use of this agent should be reserved for resistance and balanced with the risk of severe, life-threatening allergic reactions (e.g., Stevens-Johnson or drug hypersensitivity syndromes).
  - Cost: \$10-15
- Essential oils: There are no formal controlled clinical trials demonstrating efficacy, potential side effects or toxicity of eucalyptus, lavender and tea tree oil, and therefore, they cannot be recommended as a treatment option (Connolly, 2011; Tebruegge, Pantazidou, & Curtis, 2011; Eisenhower & Farrington, 2012). (Evidence Low, Recommendation I)
- Wet combing can be used alone or in addition to a topical pediculicide and is useful in cases where resistance has developed to topical agents, parents prefer to avoid chemical pediculicides or they are not well tolerated (Connolly, 2011; Ko & Elston, 2004; Tebruegge, Pantazidou, & Curtis, 2011; Diamantis, Morrell, & Burkhart, 2009; Ibarra et al., 2007; Tebruegge & Runnacles, 2007). (Evidence Moderate, Recommendation B)
  - Wet hair and apply a lubricant of choice (conditioner, vinegar, olive oil).
  - A fine-tooth louse comb (less than 0.3 mm between teeth) should be inserted until it touches the scalp and combed through the hair from root to tip. After each stroke, the comb should be visualized for any lice.
  - Wet combing should be systematically performed at least twice over entire head until no live lice are found.
  - Recommended regimen is one wet combing session every four days for at least two weeks. If lice are found on the second, third, or fourth wet combing session, wet combing should be continued until no lice have been seen for 3 consecutive sessions.
  - Louse comb cost: \$5-\$10
- LouseBuster is an appliance that uses application of heat to head and scalp to eradicate lice and eggs. One time application for 30 minutes shown to be effective with no reported adverse reactions or resistance (Bush et al., 2011; Goates et al., 2006; Eisenhower & Farrington, 2012; Madke & Khopkar, 2012; Gunning et al., 2012; Frankowski et al., 2010). (Evidence Low, Recommendation B)
  - Device sold to schools and clinics for \$2,000 and each application is \$11.
  - Limited available research into the effectiveness of this treatment

### Other Management Considerations

#### General Recommendations

- All household members and close contacts should be examined for infestation and treated only if live lice discovered (Frankowski et al., 2010; Mumcuoglu et al., 2006; Feldmeier, 2010; Gunning et al., 2012; Madke & Khopkar, 2012; Tebruegge, Pantazidou, & Curtis, 2011). (Evidence Low, Recommendation B)
- All topical pediculicidal treatments should be rinsed out of hair with cool water after the prescribed application time. Rinsing with warm (or hot) water could cause vasodilation and increase the risk of systemic absorption (Madke & Khopkar, 2012). (Evidence Low, Recommendation B)

#### Environmental Decontamination

- Primary mode of transmission is head to head contact and there is ongoing debate about the potential for reinfestation from fomite sources. However, it is advisable to launder clothes, towels, and bed linen used within 2 days at minimum temperature 60 degrees C or place in dryer at high heat for at least 40 minutes. Combs/brushes may be immersed in 60 degree C water for at least 10 minutes to kill lice/eggs (Speare, Cahill, & Thomas, 2003; Izri & Chosidow, 2006; Eisenhower & Farrington, 2012; Canyon & Speare, 2010; Takano-Lee et al., 2005; Lebwohl, Clark, & Levitt, 2007; Gunning et al., 2012; Diamantis, Morrell, & Burkhart, 2009; Finlay & MacDonald, 2008; Ibarra, 2010; Tebruegge, Pantazidou, & Curtis, 2011). (Evidence Moderate, Recommendation B)
- Items which cannot be laundered or placed in dryer can be sealed in a plastic bag for 2 weeks (Diamantis, Morrell, & Burkhart, 2009;

Finlay & MacDonald, 2008; Frankowski et al., 2010; Lebwohl, Clark, & Levitt, 2007). (Evidence Low, Recommendation B)

- It is unnecessary to fumigate carpets, car seats, and mattresses because lice are unable to live away from the human host for more than 48 to 55 hours. Vacuuming is a safe alternative to fumigation (Eisenhower & Farrington, 2012; Diamantis, Morrell, & Burkhart, 2009; Finlay & MacDonald, 2008; Frankowski et al., 2010; Shmidt & Levitt, 2012; Lebwohl, Clark, & Levitt, 2007). (Evidence Moderate, Recommendation B)

#### Return to School

"No nit" policy for return to school should be abandoned as only a small number of children with nits on their scalp are also infested with living lice leading to unnecessary treatment and loss of school/work days (Mumcuoglu et al., 2006; Gunning et al., 2012; Frankowski et al., 2010; Eisenhower & Farrington, 2012). (Evidence Moderate, Recommendation B)

#### Follow Up

- For infestation persisting after 2 treatments to evaluate for resistance or incorrect use.
  - Causes of persistent head lice may be explained by misdiagnosis, lack of adherence, inadequate treatment, reinfestation, lack of ovicidal or residual killing properties of the product, or resistance of pediculicide (Frankowski et al., 2010).
- For signs/symptoms of infection which may indicate secondary bacterial infection.

#### Special Considerations

- Children under 2 years of age
- Pregnancy

#### Definitions:

Quality of Evidence (Based on U.S. Preventive Services Task Force [USPSTF] Ratings)

High: The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.

Moderate: The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as: the number, size, or quality of individual studies, inconsistency of findings across individual studies, limited generalizability of findings to routine primary care practice, lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Low: The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: the limited number or size of studies, important flaws in study design or methods, inconsistency of findings across individual studies, gaps in the chain of evidence, findings not generalizable to routine primary care practice, lack of information on important health outcomes. More information may allow estimation of effects on health outcomes.

Grading of Recommendations (Based on USPSTF Ratings)

A: There is high certainty that the net benefit is substantial. Offer or provide this service.

B: There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. Offer or provide this service.

C: Clinicians may provide this service to selected patients depending on individual circumstances. However, for most individuals without signs or symptoms there is likely to be only a small benefit from this service. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient.

D: The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. Discourage the use of this service.

I: The current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

## Clinical Algorithm(s)

A clinical algorithm titled, "Clinical Algorithm for the Treatment and Management of Head Lice" is provided in the original guideline document.

## Scope

### Disease/Condition(s)

Pediculosis capitis (head lice)

### Guideline Category

Diagnosis

Evaluation

Management

Prevention

Treatment

### Clinical Specialty

Dermatology

Family Practice

Nursing

Pediatrics

### Intended Users

Advanced Practice Nurses

Health Care Providers

Nurses

Physician Assistants

Physicians

Public Health Departments

### Guideline Objective(s)

To update a national guideline on the management of pediculosis capitis

### Target Population

Children and adults in the United States with pediculosis capitis

# Interventions and Practices Considered

## Diagnosis

1. Combing
2. Visual inspection
3. Determination of live lice vs eggs

## Management

1. Recommended regimens
  - Permethrin 1%
  - Pyrethrin 0.33% and piperonyl butoxide 4%
  - Malathion 0.5% lotion
  - Benzyl alcohol 5% lotion
  - Ivermectin 0.5% lotion
  - Spinosad 0.9% topical suspension
2. Alternative regimens
  - Lindane 1% shampoo
  - Oral ivermectin
  - Trimethoprim and sulfamethoxazole (TMP/SMX)
  - Essential oils (not recommended)
  - Combing wet hair with a fine tooth comb
  - LouseBuster device
3. Other management considerations
  - General recommendations (examination of household members, cool water rinse)
  - Environmental decontamination
  - Return to school policy
4. Follow up
5. Special considerations in children under 2 years and pregnant women

# Major Outcomes Considered

- Alleviation of signs and symptoms
- Prevention of sequelae of infestation
- Prevention of transmission
- Toxicity of drug treatment

# Methodology

## Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

## Description of Methods Used to Collect/Select the Evidence

To select evidence for critical appraisal by the group the Medline (U.S. National Library of Medicine), Cumulative Index to Nursing and Allied Health Literature (CINAHL), EBSCO, and PubMed databases were searched for the years 2000 to 2013 using the keywords "head lice" and "pediculosis capitis" in the title, abstract, and indexing forms. Additional resources were found using bibliographies of relevant articles.

## Number of Source Documents

86 source documents

## Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

Quality of Evidence (Based on U.S. Preventive Services Task Force [USPSTF] Ratings)

High: The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.

Moderate: The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by such factors as: the number, size, or quality of individual studies, inconsistency of findings across individual studies, limited generalizability of findings to routine primary care practice, lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.

Low: The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: the limited number or size of studies, important flaws in study design or methods, inconsistency of findings across individual studies, gaps in the chain of evidence, findings not generalizable to routine primary care practice, lack of information on important health outcomes. More information may allow estimation of effects on health outcomes.

## Methods Used to Analyze the Evidence

Systematic Review

## Description of the Methods Used to Analyze the Evidence

Not stated

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

Guidelines were drafted by graduate students following review of the literature.

## Rating Scheme for the Strength of the Recommendations

Grading of Recommendations (Based on the U.S. Preventive Services Task Force Ratings)

A: There is high certainty that the net benefit is substantial. Offer or provide this service.

B: There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. Offer or provide this service.

C: Clinicians may provide this service to selected patients depending on individual circumstances. However, for most individuals without signs or symptoms there is likely to be only a small benefit from this service. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient.

D: The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. Discourage the use of this service.

I: The current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined. If the service is offered, patients should understand the uncertainty about the balance of benefits and harms.

## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Internal Peer Review

## Description of Method of Guideline Validation

The Family Nurse Practitioner students submitted the draft recommendations to the University of Texas at Austin School of Nursing faculty for review. The draft was later revised to incorporate faculty recommendations.

## Evidence Supporting the Recommendations

## References Supporting the Recommendations

Aditya S, Rattan A. Spinosad: An effective and safe pediculicide. *Indian Dermatol Online J.* 2012 Sep;3(3):213-4. [PubMed](#)

Ameen M, Arenas R, Villanueva-Reyes J, Ruiz-Esmerjand J, Millar D, Dominguez-Duenas F, Haddad-Angulo A, Rodriguez-Alvarez M. Oral ivermectin for treatment of pediculosis capitis. *Pediatr Infect Dis J.* 2010 Nov;29(11):991-3. [PubMed](#)

Balcioglu C, Burgess IF, Limoncu ME, Sahin MT, Ozbek Y, Bilal C, Kurt O, Larsen KS. Plastic detection comb better than visual screening for diagnosis of head louse infestation. *Epidemiol Infect.* 2008 Oct;136(10):1425-31. [PubMed](#)

Barker SC, Altman PM. An ex vivo, assessor blind, randomised, parallel group, comparative efficacy trial of the ovicidal activity of three pediculicides after a single application--melaleuca oil and lavender oil, eucalyptus oil and lemon tea tree oil [trunc]. *BMC Dermatol.* 2011;11:14. [PubMed](#)

Bowerman JG, Gomez MP, Austin RD, Wold DE. Comparative study of permethrin 1% creme rinse and lindane shampoo for the treatment of head lice. *Pediatr Infect Dis J.* 1987 Mar;6(3):252-5. [PubMed](#)

Brandenburg K, Deinard AS, DiNapoli J, Englander SJ, Orthoefer J, Wagner D. 1% permethrin cream rinse vs 1% lindane shampoo in treating pediculosis capitis. *Am J Dis Child.* 1986 Sep;140(9):894-6. [PubMed](#)



Bush SE, Rock AN, Jones SL, Malenke JR, Clayton DH. Efficacy of the LouseBuster, a new medical device for treating head lice (Anoplura:Pediculidae). *J Med Entomol*. 2011 Jan;48(1):67-72. [PubMed](#)

Canyon DV, Speare R. Indirect transmission of head lice via inanimate objects. *Open Dermatol J*. 2010;4(1):72-6.

Centers for Disease Control and Prevention (CDC). Parasites: head lice. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2010.

Chosidow O, Giraudeau B, Cottrell J, Izri A, Hofmann R, Mann SG, Burgess I. Oral ivermectin versus malathion lotion for difficult-to-treat head lice. *N Engl J Med*. 2010 Mar 11;362(10):896-905. [PubMed](#)

Cole SW, Lundquist LM. Spinosad for treatment of head lice infestation. *Ann Pharmacother*. 2011 Jul;45(7-8):954-9. [PubMed](#)

Connolly M. Current recommended treatments for head lice and scabies. *Prescriber*. 2011;11(1-2):26-39.

Currie MJ, Reynolds GJ, Glasgow NJ, Bowden FJ. A pilot study of the use of oral ivermectin to treat head lice in primary school students in Australia. *Pediatr Dermatol*. 2010 Nov-Dec;27(6):595-9. [PubMed](#)

Diamantis SA, Morrell DS, Burkhart CN. Treatment of head lice. *Dermatol Ther*. 2009 Jul-Aug;22(4):273-8. [PubMed](#)

Eisenhower C, Farrington EA. Advancements in the treatment of head lice in pediatrics. *J Pediatr Health Care*. 2012 Nov-Dec;26(6):451-61; quiz 462-4. [PubMed](#)

Feldmeier H. Diagnosis of head lice infestations: an evidence-based review. *Open Dermatol J*. 2010;4(1):69-71.

Feldmeier H. Pediculosis capitis: new insights into epidemiology, diagnosis and treatment. *Eur J Clin Microbiol Infect Dis*. 2012 Sep;31(9):2105-10. [PubMed](#)

Finlay J, MacDonald NE. Head lice infestations: A clinical update. *Paediatr Child Health*. 2008 Oct;13(8):692-704. [PubMed](#)

Frankowski BL, Bocchini JA Jr, Council on School Health and Committee on Infectious Diseases. Head lice. *Pediatrics*. 2010 Aug;126(2):392-403. [PubMed](#)

Frankowski BL, Weiner LB. Head lice. *Pediatrics*. 2002 Sep;110(3):638-43. [46 references] [PubMed](#)

Goates BM, Atkin JS, Wilding KG, Birch KG, Cottam MR, Bush SE, Clayton DH. An effective nonchemical treatment for head lice: a lot of hot air. *Pediatrics*. 2006 Nov;118(5):1962-70. [PubMed](#)

Goundrey-Smith S. Looking at the life cycle and treatment of head lice. *Br J School Nurs*. 2011;6(3):123-6.

Gunning K, Pippitt K, Kiraly B, Sayler M. Pediculosis and scabies: treatment update. *Am Fam Physician*. 2012 Sep 15;86(6):535-41. [PubMed](#)

Heukelbach J, Pilger D, Oliveira FA, Khakban A, Ariza L, Feldmeier H. A highly efficacious pediculicide based on dimeticone: randomized observer blinded comparative trial. *BMC Infect Dis.* 2008;8:115. [PubMed](#)

Ibarra J, Fry F, Clarice W, Olsen A, Vander Stichele RH, Lapeere H, Maryan J, Franks A, Smith JL. Overcoming health inequalities by using the Bug Busting 'whole-school approach' to eradicate head lice. *J Clin Nurs.* 2007 Oct;16(10):1955-65. [PubMed](#)

Ibarra J. Diagnosis of head lice in the community. *Br J School Nurs.* 2010;5(4):191-4.

Izri A, Chosidow O. Efficacy of machine laundering to eradicate head lice: recommendations to decontaminate washable clothes, linens, and fomites. *Clin Infect Dis.* 2006 Jan 15;42(2):e9-10. [PubMed](#)

Jahnke C, Bauer E, Hengge UR, Feldmeier H. Accuracy of diagnosis of pediculosis capitis: visual inspection vs wet combing. *Arch Dermatol.* 2009 Mar;145(3):309-13. [PubMed](#)

Ko CJ, Elston DM. Pediculosis. *J Am Acad Dermatol.* 2004 Jan;50(1):1-12; quiz 13-4. [101 references] [PubMed](#)

Lebwohl M, Clark L, Levitt J. Therapy for head lice based on life cycle, resistance, and safety considerations. *Pediatrics.* 2007 May;119(5):965-74. [76 references] [PubMed](#)

Madke B, Khopkar U. Pediculosis capitis: an update. *Indian J Dermatol Venereol Leprol.* 2012 Jul-Aug;78(4):429-38. [PubMed](#)

Martinez-Diaz G, Mancini A. CNE series. Head lice: diagnosis and therapy. *Dermatol Nurs.* 2010;22(4):2-8.

McCormack PL. Spinosad: in pediculosis capitis. *Am J Clin Dermatol.* 2011 Oct 1;12(5):349-53. [PubMed](#)

Meinking TL, Clineschmidt CM, Chen C, Kolber MA, Tipping RW, Furtek CI, Villar ME, Guzzo CA. An observer-blinded study of 1% permethrin creme rinse with and without adjunctive combing in patients with head lice. *J Pediatr.* 2002 Nov;141(5):665-70. [PubMed](#)

Meinking TL, Mertz-Rivera K, Villar ME, Bell M. Assessment of the safety and efficacy of three concentrations of topical ivermectin lotion as a treatment for head lice infestation. *Int J Dermatol.* 2013 Jan;52(1):106-12. [PubMed](#)

Meinking TL, Vicaria M, Eyerdam DH, Villar ME, Reyna S, Suarez G. A randomized, investigator-blinded, time-ranging study of the comparative efficacy of 0.5% malathion gel versus Ovide Lotion (0.5% malathion) or Nix Creme Rinse (1% permethrin) used as labeled, for the treatment of head lice. *Pediatr Dermatol.* 2007 Jul-Aug;24(4):405-11. [PubMed](#)

Meinking TL, Vicaria M, Eyerdam DH, Villar ME, Reyna S, Suarez G. Efficacy of a reduced application time of Ovide lotion (0.5% malathion) compared to Nix creme rinse (1% permethrin) for the treatment of head lice. *Pediatr Dermatol.* 2004 Nov-Dec;21(6):670-4. [PubMed](#)

Meinking TL, Villar ME, Vicaria M, Eyerdam DH, Paquet D, Mertz-Rivera K, Rivera HF, Hiriart J, Reyna S. The clinical trials supporting benzyl alcohol lotion 5% (Ulesfia): a safe and effective topical treatment for head lice (pediculosis humanus capitis). *Pediatr Dermatol.* 2010 Jan-Feb;27(1):19-24. [PubMed](#)

Mumcuoglu KY, Friger M, Ioffe-Uspensky I, Ben-Ishai F, Miller J. Louse comb versus direct visual examination for the diagnosis of head louse infestations. *Pediatr Dermatol*. 2001 Jan-Feb;18(1):9-12. [PubMed](#)

Mumcuoglu KY, Meinking TA, Burkhart CN, Burkhart CG. Head louse infestations: the "no nit" policy and its consequences. *Int J Dermatol*. 2006 Aug;45(8):891-6. [36 references] [PubMed](#)

Nofal A. Oral ivermectin for head lice: a comparison with 0.5 % topical malathion lotion. *J Dtsch Dermatol Ges*. 2010 Dec;8(12):985-8. [PubMed](#)

Pariser DM, Meinking TL, Bell M, Ryan WG. Topical 0.5% ivermectin lotion for treatment of head lice. *N Engl J Med*. 2012 Nov;367(18):1687-93. [20 references] [PubMed](#)

Prescriber's Letter. Treatment of head lice - an update. Stockton (CA): Therapeutic Research Center; 2010.

Shmidt E, Levitt J. Dermatologic infestations. *Int J Dermatol*. 2012 Feb;51(2):131-41. [PubMed](#)

Speare R, Cahill C, Thomas G. Head lice on pillows, and strategies to make a small risk even less. *Int J Dermatol*. 2003 Aug;42(8):626-9. [PubMed](#)

Stough D, Shellabarger S, Quiring J, Gabrielsen AA Jr. Efficacy and safety of spinosad and permethrin creme rinses for pediculosis capitis (head lice). *Pediatrics*. 2009 Sep;124(3):e389-95. [PubMed](#)

Strycharz JP, Berge NM, Alves AM, Clark JM. Ivermectin acts as a posteclosion nymphicide by reducing blood feeding of human head lice (Anoplura: Pediculidae) that hatched from treated eggs. *J Med Entomol*. 2011 Nov;48(6):1174-82. [PubMed](#)

Strycharz JP, Yoon KS, Clark JM. A new ivermectin formulation topically kills permethrin-resistant human head lice (Anoplura: Pediculidae). *J Med Entomol*. 2008 Jan;45(1):75-81. [PubMed](#)

Takano-Lee M, Edman JD, Mullens BA, Clark JM. Transmission potential of the human head louse, *Pediculus capitis* (Anoplura: Pediculidae). *Int J Dermatol*. 2005 Oct;44(10):811-6. [PubMed](#)

Taplin D, Meinking TL, Castillero PM, Sanchez R. Permethrin 1% creme rinse for the treatment of *Pediculus humanus var capitis* infestation. *Pediatr Dermatol*. 1986 Sep;3(4):344-8. [PubMed](#)

Taro Pharmaceuticals. Ovide lotion: highlights of prescribing information. Hawthorne (NY): Taro Pharmaceuticals; 2011.

Tebruegge M, Pantazidou A, Curtis N. What's bugging you? An update on the treatment of head lice infestation. *Arch Dis Child Educ Pract Ed*. 2011 Feb;96(1):2-8. [95 references] [PubMed](#)

Tebruegge M, Runnacles J. Is wet combing effective in children with pediculosis capitis infestation. *Arch Dis Child*. 2007 Sep;92(9):818-20. [19 references] [PubMed](#)

Thomas DR, McCarroll L, Roberts R, Karunaratne P, Roberts C, Casey D, Morgan S, Touhig K, Morgan J, Collins F, Hemingway J.

Surveillance of insecticide resistance in head lice using biochemical and molecular methods. Arch Dis Child. 2006 Sep;91(9):777-8. [PubMed](#)

U.S. Food and Drug Administration. FDA public health advisory: safety of topical lindane products for the treatment of scabies and lice. Silver Spring (MD): U.S. Food and Drug Administration; 2009 Apr 30.

Villegas SC, Breitza RL. Head lice and the use of spinosad. Clin Ther. 2012 Jan;34(1):14-23. [PubMed](#)

## Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

- Appropriate diagnosis and treatment of pediculosis capitis
- Decreased transmission of pediculosis capitis
- Decreased re-infection rate
- Decreased risk of secondary infections

### Potential Harms

- All pediculicides may cause burning, stinging, itching, or irritation at the site of application.
- Permethrin may cause burning, pruritus, erythema and numbness/tingling.
- Pyrethrin/piperonyl butoxide topical may cause irritation and contact dermatitis.
- Malathion:
  - Conjunctivitis has been reported following contact with the eyes.
  - Malathion is flammable and should therefore be kept away from open flames and electric heat sources such as hair dryers and curling irons.
- Benzyl alcohol lotion (Ulesfia) may cause ocular irritation, application site irritation, application site anesthesia and hypoesthesia, pruritus, application site dryness, excoriation, and dermatitis, thermal burn, erythema, rash, and skin exfoliation.
- Topical ivermectin (Sklice) may cause conjunctivitis, ocular hyperemia or irritation, seborrhea, xeroderma, or burning sensation.
- Spinosad topical suspension (Natroba) may cause application site erythema, ocular erythema, application site dryness, exfoliation, and alopecia.
- Lindane:
  - Black box warning: may cause neurologic toxicity and seizures.
  - May cause dizziness, dermatitis, alopecia, headache, pain, paresthesia, pruritus, and urticaria.
- Oral ivermectin may cause pruritus, rash, fever, edema, lymphadenopathy, headache, myalgia, dizziness, tachycardia, abnormal eye sensation, limbitis, conjunctivitis, ocular inflammation, orthostatic hypotension, liver enzyme elevations, eosinophilia, seizures, Stevens-Johnson syndrome, toxic epidermal necrolysis, asthma exacerbations, vision loss, conjunctival hemorrhage, hepatitis.
- Bactrim/Septra may cause nausea, vomiting, anorexia, rash, urticaria, hypersensitivity reaction, photosensitivity, diarrhea, dizziness, dyspepsia, headache, lethargy, Stevens-Johnson syndrome, toxic epidermal necrolysis, fulminant hepatic necrosis, blood dyscrasias, renal impairment/failure, pancreatitis, hepatotoxicity, interstitial nephritis, photosensitivity, pulmonary infiltrates, myelosuppression, methemoglobinemia, hyperkalemia, aseptic meningitis, seizures, lupus erythematosus, *Clostridium difficile* associated diarrhea, rhabdomyolysis, & kernicterus (neonates).

### Pregnancy Considerations

- Permethrin, malathion, benzyl alcohol, and Spinosad are category B drugs.
- Lindane, pyrethrin/piperonyl butoxide, Bactrim/Septra, ivermectin oral, and ivermectin lotion are category C drugs.

# Contraindications

## Contraindications

- Permethrin:
  - Contraindications include hypersensitivity to pyrethroid, pyrethrin/piperonyl butoxide topical, chrysanthemums or any component of the formulation.
  - Contraindicated for use in infants less than 2 months of age.
- Pyrethrin/piperonyl butoxide topical:
  - Contraindications include hypersensitivity to pyrethrins, ragweed, chrysanthemums or any component of the formulation.
  - Contraindicated for use in children less than 2 years of age.
- Malathion:
  - Contraindications include hypersensitivity to malathion or any component of the formulation.
  - Contraindicated for use in neonates and infants.
- Benzyl alcohol lotion (Ulesfia):
  - Contraindications include hypersensitivity to benzyl alcohol or any component of the formulation.
  - Contraindicated for use in infants less than 6 months old.
- Topical ivermectin (Sklice):
  - Contraindications for the use of topical ivermectin include hypersensitivity to ivermectin or any component of the formulation.
  - Contraindicated for use in infants less than 6 months old.
- Spinosad topical suspension (Natroba):
  - Contraindications for the use of Spinosad include hypersensitivity to Spinosad or any component of the formulation.
  - Contraindicated for use in children less than 4 years of age.
- Lindane:
  - Contraindications include hypersensitivity to Lindane or any component of the formulation.
  - Contraindicated for use in premature infants and individuals with known uncontrolled seizure disorders.
  - Caution should be used in infants, children, elderly, and patients weighing less than 50 kg.
- Oral ivermectin (Stromectol):
  - Contraindications for the use of oral ivermectin include hypersensitivity to drug, class, or components. Caution if asthma.
  - Use should be avoided in children <33 lbs, pregnancy, or breastfeeding.
- Trimethoprim/sulfamethoxazole (TMP/SMX) (Bactrim/Septtra):
  - Contraindications include hypersensitivity to sulfonamides, trimethoprim, or any component of the formulation, porphyria, megaloblastic anemia, folate deficiency, G6PD deficiency, significant hepatic impairment, severe renal disease, pregnancy, and breastfeeding.
  - Contraindicated for use in infants less than 2 months of age.

## Qualifying Statements

### Qualifying Statements

- Recent primary studies of permethrin or pyrethrin/piperonyl butoxide topical were limited due to long established safety and efficacy profiles.
- Newer drugs also had limited research available due to short time on market.
- The vast majority of trials reviewed included only children as the majority of infestations occur in this population.
- These recommendations are meant to serve as a source of clinical guidance. Health care providers should always consider the individual clinical circumstances of each person in the context of local disease prevalence as well as resistance. These guidelines focus on the treatment and counseling of individual patients and do not address other components of a community that are important in pediculosis capitis detection and prevention, such as schools and daycare centers.

## Implementation of the Guideline

## Description of Implementation Strategy

An implementation strategy was not provided.

## Implementation Tools

Clinical Algorithm

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Getting Better

Staying Healthy

### IOM Domain

Effectiveness

Patient-centeredness

## Identifying Information and Availability

### Bibliographic Source(s)

University of Texas, School of Nursing Family Nurse Practitioner Program. Guidelines for the diagnosis and treatment of pediculosis capitis (head lice) in children and adults 2013. Austin (TX): University of Texas, School of Nursing; 2013 May. 21 p. [57 references]

### Adaptation

Not applicable: The guideline was not adapted from another source.

### Date Released

2002 May (revised 2013 May)

### Guideline Developer(s)

University of Texas at Austin School of Nursing, Family Nurse Practitioner Program - Academic Institution

### Source(s) of Funding

## Guideline Committee

Practice Guidelines Committee

## Composition of Group That Authored the Guideline

*Authors:* Brittany Bohl, RN; Jessica Evetts, RN; Kymberli McClain, RN; Amanda Rosenauer, RN; Emily Stelltano, RN

*Consultant:* Lisa Doggett, MD, MPH

## Financial Disclosures/Conflicts of Interest

Not stated

## Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: University of Texas, School of Nursing, Family Nurse Practitioner Program. Guidelines for the diagnosis and treatment of pediculosis capitis (head lice) in children and adults. Austin (TX): University of Texas, School of Nursing; 2008 May. 17 p.

## Guideline Availability

Electronic copies: None available.

Print copies: Available from the University of Texas at Austin, School of Nursing, 1700 Red River, Austin, Texas, 78701-1499, Attn: Nurse Practitioner Program

## Availability of Companion Documents

None available

## Patient Resources

None available

## NGC Status

This NGC summary was completed by ECRI on October 3, 2002. The information was verified by the guideline developer on October 16, 2002. This summary was updated by ECRI Institute on September 18, 2008. This summary was updated by ECRI Institute on September 23, 2013.

## Copyright Statement

This NGC summary is based on the original guideline, which may be subject to the guideline developer's copyright restrictions.

## Disclaimer

## NGC Disclaimer

The National Guideline Clearinghouse<sup>â„¢</sup> (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at <http://www.guideline.gov/about/inclusion-criteria.aspx>.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.